REQUEST FOR RECONSIDERATION

Claims 7-16, 18-26 and 30-34 remain active in this application.

The claimed invention is directed to a method for producing allyl compounds.

Applicants wish to thank examiner Keys for the helpful and courteous discussion held with their U.S. representative on January 23, 2008. At that time, applicants' U.S. representative argued that selection of a species of ligand and a species of nucleophile from the two different genera precluded a conclusion of anticipation and that the examiner's belief that the claimed invention was already in the public possession is contradicted by the evidence of a problem of a low reactivity of oxygen nucleophiles which existed beyond the 1977 issuance of Trost et al. The following is intended to expand upon the discussion with the examiner.

Transition metal catalyzed reaction of allyl compounds to form new allyl compounds have been generally reported. Reaction of some oxygen nucleophilic agents such as alcohols has produced disappointing results in view of a low reactivity. (page 3 of applicants' specification, first full paragraph) Accordingly, methods of producing allyl compounds with oxygen substituents from allyl compounds are sought.

The claimed invention addresses this problem by providing a method of producing an allyl compound by reacting an allyl compound with an **oxygen nucleophilic agent**, the reaction being catalyzed by a Group 8-10 transition metal catalyst containing a **monodentate trialkyl phosphite compound**. Applicants have discovered that monodentate trialkyl phosphite compounds having linear or branched alkyl groups to provided unexpectedly high yield in formation of allyl compounds with certain oxygen nucleophiles.

The rejections of claims 7-9, 11, 14, 15, 18, 22-24 and 30-32 under 35 U.S.C. 102(b) over Trost et al., U.S. 4,051,157, of claims 7-9, 11, 12, 14-16, 18, 20-24 and 30-34 under 35 U.S.C. 102(b) over Kurtz et al., U.S. 3,755,451 alone or in view of Bryant, U.S. 3,534,088

and of claims 7-16, 18-26 and 30-34 under 35 U.S.C. 103(a) over Kurtz et al., U.S. 3,755,451 alone or in view Hefner, Jr., U.S. 4,613,703 are respectfully traversed.

None of the cited references disclose or suggest the specific combination of trialkyl phosphite with an oxygen nucleophile.

Trost et al. broadly describe Pd mediated allyl reactions in which a phosphorus compounds such a triphenylphosphine, a trialkyl phosphine, a trialkyl phosphite a hexamethylphosphorous triamine or other polyphosphorus compounds are used (column 3, lines 34-49). Carbon nucleophiles are specifically mentioned but can be replaced with oxygen or nitrogen nucleophiles by replacing carbanions with the corresponding nitrogen or oxygen compounds (column 4, lines 26-29). There is no specific disclosure of trialkyl phosphite used in conjunction with specific oxygen nucleophiles.

Thus, in order to arrive at the claimed invention one of ordinary skill in the art would have had to 1) select trialkyl phosphites from a broad list of trivalent phosphorus compounds and 2) selecte oxygen nucleophiles having a structure AO from the vast list of nucleophiles. Such selection from broad disclosures fails to anticipate the claimed invention.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). M.P.E.P. § 2131.

Trost et al. fail to disclose oxygen nucleophiles having the claimed structure expressed by AO-H or its deprotonated form AO^-. . ."Such a general description fails to detail the oxygen nucleophiles expressed by the formula AO-H or AO^-.

Furthermore, Trost et al. disclose a very broad genus of catalysts ("any trivalent phosphorous compound", col. 3, lines 43-44). Trost et al. do not disclose any specific combination of a trialkyl phosphite in conjunction with and an oxygen nucleophilic agent

In contrast, the claimed the invention is directed to specific catalysts containing a monodentate trialkyl phosphite containing of formula (I) in conjunction with oxygen nucleophiles having a structure expressed by AO-H or its deprotonated form AO^-. As the cited reference fails to describe the claimed invention with the same specificity as claimed, the claimed invention is clearly not anticipated by this reference.

During the meeting with the examiner, the examiner noted M.P.E.P. .§ 2131.02 and the citation therein to *Ex parte A* 17 USPQ2d 1716 (Bd. Pat. App. & Inter. 1990) for the position that

> A genus does not always anticipate a claim to a species within a genus. However, when the species is clearly named, that species claimed is anticipated no matter how many other species are additionally named.

Applicants note that *Ex parte A* related to claims to **a chemical compound** and **not a method** in which two different species are needed to be selected. Thus, unlike *Ex parte A*, the claimed species is not clearly named because a reaction which uses 1) a trialkyl phosphite ligand; in conjunction with 2) an oxygen nucleophile is not clearly named.

The same deficiency is found in the reference of Kurtz et al.

Kurtz et al. broadly suggest using metal catalyst with trihydrocarbylphosphines, triarylphosphines, and tertiary alkarylphosphines (column 8, lines 43-58). Each of the working examples uses triphenylphos**phine**, which is an arylphosphine, not a trialkyl phosphite.

Reactive compounds which participate in the exchange reaction include primary and secondary aliphatic amines, alcohols, carboxylic acids and compounds containing activated

carbon-hydrogen bonds (column 5, line 45 through column 6, line 75). Thus, as in Trost et al., one of ordinary skill in the art would necessarily have to have selected trialkyl phosphite from the vast disclosure of ligands and oxygen nucleophilic agents having a structure AO-H or AO^- from the vast disclosure of reactive compounds. Such selection fails to give rise to anticipation and accordingly withdrawal of the rejections under 35 U.S.C. §102(b) is respectfully requested.

Not only is the claimed invention not anticipated by the cited references, but the claimed invention would not have been obvious based on the cited disclosures as there is no suggestion that trialkyl phosphites would provide improved yields in reaction of oxygen nucleophiles as claimed.

A characteristic feature of the invention resides in that in its ability to produce a desired second allyl compound using an oxygen nucleophilic agent having a specific structure. The problems solved by selecting a specific oxygen nucleophilic agent as well as a particular type of phosphite compound are disclosed on page 5, lines 14 to 25 of the specification. Trost et al. do not disclose or suggest that such a remarkable effect can be developed by combination of these compounds. As recognized by the inventors, **superior product yields** are achieved using the oxygen nucleophiles of the invention in conjunction with the required phosphite-containing catalysts.

As exemplified in the specification, when PPh_3 as an aryl phosphine (Comparative Example 5) and $P(OPh)_3$ (Comparative Example 6) as an aryl phosphite are used, the reaction with an oxygen nucleophilic agent does not efficiently proceed. On the other hand, when $P(OiPr)_3$ (Example 3) as an alkyl phosphite which falls within the scope of claim of the present invention is used, excellent reactivity is seen. Accordingly, the inventors have found a reaction with an oxygen nucleophilic agent which is not disclosed or suggested by the prior

art. This discovery clearly represents an inventive step (is indicative of non-obviousness) of the claimed invention.

	Ligand	Oxygen nucleophilic agent	Yield of the second allyl compound
Example 3	Triisopropyl phosphite	1-Octanol	38%
Comparative Example 5	Triphenyl phosphine	1-Octanol	7%
Comparative Example 6	Triphenyl phosphite	1-Octanol	3%

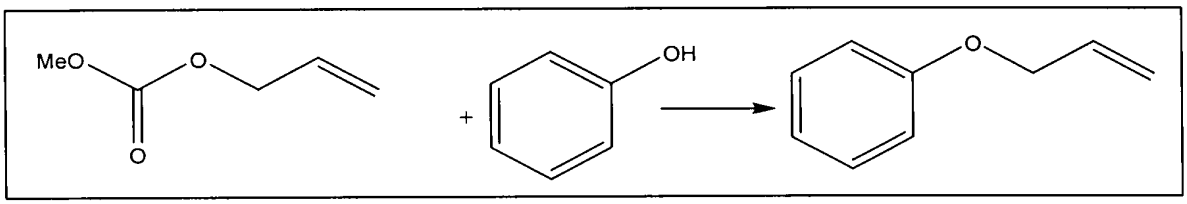
As is evident from the above Table, the yield of the desired second allyl compound is very low when an oxygen nucleophilic agent and a phosphine compound are combined. Even when an oxygen nucleophilic agent is combined with an aryl phosphite compound unlike those required by the invention (a triphenyl phosphite does not have the required straight or branched alkyl group), the yield of the secondary allyl compound is very low (e.g. 3% for triphenyl phosphite).

Trost et al. neither disclose nor suggest that the catalyst having a high activity can be obtained by **selecting** an oxygen nucleophilic agent having a specific structure and an alkyl phosphite compound having a specific structure.

The examples in the specification show the comparative yields obtained when triisopropyl phosphite and triethyl phosphite were used as the monodentate phosphite. The effects of varying the alkyl chain length in the compound of formula (I) on yield of allyl products are shown in the specification and by the experimental data below.

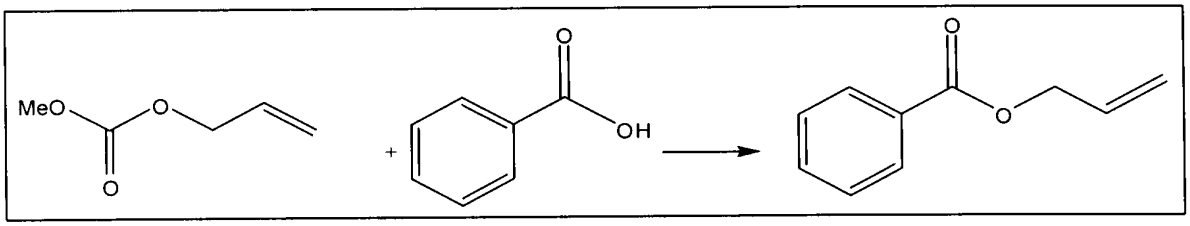
Applicants have also submitted the declaration of Mr. Masaki Takai, a named inventor of the above identified application of the further improved yields with oxygen nucelophiles as claimed with a trialkylphosphite compound as claimed.

The experimental data in the following section refer to the following chemical reaction which produces allyl phenyl ether.



Formula (I) compound		Yield (allyl phenyl ether)
Triisopropyl phosphite	Example 1	**97%**
Triethyl phosphite	Example 2	**50**
Tributyl phosphite	Declaration	**66**
Tris (2-ethylhexyl) phosphite	Declaration	**58**
Triisodecyl phosphite	Declaration	**45**
Triphenyl phosphite	Comp. Ex. 2	3
Tris (2,4-di-t-butylphenyl) phosphite	Comp. Ex. 3	0
DPPB (bidentate phosphine)	Comp. Ex. 1	4

The experimental data in the next section refer to the following chemical reaction which produces allyl benzoate.



Formula (I) compound		Yield (allyl benzoate)
Triisopropyl phosphite	Example 4	**60%**
Tributyl phosphite	Declaration	**59**
Tris (2-ethylhexyl) phosphite	Declaration	**65**
Triisodecyl phosphite	Declaration	**54**
Triphenyl phosphite	Comp. Ex. 9	21
DPPB (bidentate phosphine)	Comp. Ex. 8	1

As shown above, selection of the particular catalysts and reactants as claimed provides superior product yields.

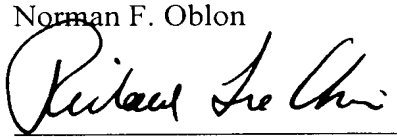
As there is no suggestion of an improved yield by selection of trialkylphosphite compound with oxygen nucleophiles as claimed the claimed invention would not have been

obvious over the cited references and withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



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17 USPQ2d 1716

Ex parte A

U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences

No. 89-2432

Mailed June 5, 1990

Headnotes

PATENTS

[1] Patentability/Validity - Anticipation - Prior art (► 115.0703)

Applicant's claim for chemical compound is anticipated by prior art reference, since it is undisputed that synthetic procedures disclosed in reference enable preparation of compound also disclosed therein, and that name of compound thus disclosed corresponds to formula presented in applicant's claim; listing of forty-five additional compounds in reference does not change this outcome, since comprehensiveness of reference does not derogate from its teaching effect, and listing thus "describes" each of those compounds within meaning of 35 USC 102(a).

[2] Patentability/Validity - Anticipation - Prior art (► 115.0703)

Application claim which broadly recites claimed chemical compounds as "an antibacterial composition," is anticipated by reference which discloses forty-six compounds as having "antibacterial activity" and as being "meant for use as active compounds in medicaments," and which further expressly discloses various types of specific pharmaceutical compositions utilizing various acceptable carriers, since nature of disclosure is such that reference should appropriately be considered to "describe" each of compounds disclosed within meaning of 35 USC 102.

[3] Patentability/Validity - Obviousness - Relevant prior art - Particular inventions (► 115.0903.03)

Examiner improperly rejected claimed antibacterial compound as obvious, even though applicant's claims are prima facie obvious in view of primary reference, since examiner required applicant to prove that claimed compound is unexpectedly different from compounds of reference in its therapeutic effect against all bacteria in order to rebut evidence of obviousness, whereas applicant's contention that claimed compound is unexpectedly and significantly superior against anaerobic bacteria only is conceptually sufficient to overcome prima facie case, and since record shows that claimed compound is in fact significantly more active against anaerobic bacteria than closest compound of reference, and that such superiority was unexpected.

Case History and Disposition

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Appeal from final rejection of claims in patent application (Donald G. Daus, supervisory primary examiner; E. Bernhardt, examiner).

Patent application serial no. 834,577, filed Feb. 28, 1986 (quinolonecarboxylic acid derivative and process for its preparation). From final rejection of all pending claims, applicant appeals. Affirmed.

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Attorneys

Richard D. Kelly, of Oblon, Fisher, Spivak, McClelland & Maier, Arlington, Va., for appellants.

Judge

Before Goldstein, Metz, and Wiseman, examiners-in-chief.

Opinion Text

Opinion By:

Goldstein, examiner-in-chief.

This appeal was originally taken from the examiner's final rejection of claims 1, 3, and 4. Subsequently claim 4 was cancelled. Although, at the beginning of appellants' appeal brief, it is stated that this appeal is "from the final rejection of all claims pending in this application," claim 3 was not reproduced in the brief on appeal. The examiner assumed that this omission was inadvertent but, by implication from the fact that claim 3 has not been *argued* separately in the brief, and from statements made upon oral hearing of this appeal, it appears likely that the rejection of claim 3 was not intended to be appealed. Nonetheless, in the event that we are mistaken in drawing this inference, we shall treat claim 3 as being on appeal. Because, as we have already indicated, no separate arguments have been presented, claim 3 may be considered to stand or fall with claim 1. *In re King,* 801 F.2d 1324, 231 USPQ 136 (Fed.Cir. 1986); *In re Burckel,* 592 F.2d 1175, 201 USPQ 67 (CCPA 1979). Even so, for the sake of completeness, we shall address specific remarks to the patentability of claim 3 in this decision.

References relied on by the examiner on appeal are:

Culbertson et al. (Culbertson)	4,638,067	Jan. 20, 1987
Petersen et al. (Petersen) (European patent specification)	167,763	Jan. 15, 1986
Irikura (Great Britain)	2,057,440	Apr. 1, 1981

Claims 1 and 3 have been finally rejected under 35 U.S.C. §102(a) as being anticipated by Peterson. We shall affirm this rejection.

All page references in the following discussion shall be to the English language translation of record (apparently supplied by appellants) of the European patent specification, which was originally published in German.

All page references in the following discussion shall be to the English language translation of record (apparently supplied by appellants) of the European patent specification, which was originally published in German.

The examiner has adequately explained the basis of the conclusion that the reference anticipates the appealed claims and sufficiently convincingly rebutted all of appellants' arguments that we could simply adopt the examiner's position as our own, adding no further comment. However, since appellants have expressly invited us to decide what they consider to be "a significant policy question," [1] we feel constrained to present additional comments, both to emphasize those aspects of the examiner's position with

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which we agree and for the sake of completeness.

[1] The "policy question" appears to be whether or not the Patent and Trademark Office shall continue to interpret 35 U.S.C. §102(a) literally.

[1] Appellants have acknowledged (at least implicitly on the written record and expressly upon oral hearing) that the synthetic procedures disclosed in the reference enable the preparation of the compound [* * *], which is explicitly disclosed at page 13 of the reference. It has not been controverted that the name of the compound disclosed corresponds to the formula presented in appellants' claim 1. Thus, even if there were no disclosure of utility in the reference, the examiner would have been correct in holding that the claim was anticipated, and the examiner's citation of *In re Hafner,* 56 CCPA 1424, 410 F.2d 1403, 161 USPQ 783 (1969) would have been quite appropriate. Since the reference does disclose a specific utility for the compound (generally the same utility as in the present case), this issue does not arise (but see the discussion of Claim 3, below).

We find only twenty-two compounds in the list presented at pages 12 to 14, disclosed in addition to those listed in the working examples, and not twenty-three as found by the examiner. There are twenty-four compounds disclosed in the working examples. In either event, forty-six or forty-seven compounds hardly amounts to the "list of thousands" referred to in *In re Wiggins,* 488 F.2d 538, 543, 179 USPQ 421, 425 (CCPA 1973), relied on by appellants. Furthermore, as the examiner has correctly pointed out, the critical issue in *Wiggins* was whether or not the name of a compound was a description of that compound in the absence of a known synthetic method of producing that compound. That issue does not arise on the present facts.

Even if the number of compounds disclosed in the reference were several orders of magnitude greater, we would come to the same conclusion. The tenth edition of the *Merck Index* lists ten thousand compounds. In our view, each and every one of those compounds is "described," as that term is used in 35 U.S.C. §102(a), in that publication. A similar conclusion would be appropriate with respect to the approximately 1.5 million compounds disclosed in the *Beilstein Handbook* (Handbuch der Organischen Chemie). As a general principle it has long been held, even where the issue was one of obviousness and not clear anticipation or description, that the comprehensiveness of a reference disclosure does not derogate from its teaching effect. *Merck Co. v. Biocraft Laboratories, Inc.,* —F.2d —, 10 UPSQ2d 1843 (Fed.Cir. 1989); *In re Corkill,* 771 F.2d 1496, 226 USPQ 105 (Fed.Cir. 1985). *In re Susi,* 58 CCPA 1074, 440 F.2d 442, 169 USPQ 423 (1971); *In re Lemin,* 51 CCPA 1404, 332 F.2d 839, 141 USPQ 814 (CCPA 1964); *In re Rosicky,* 276 F.2d 656, 125 USPQ 341 (CCPA 1960).

With regard to the numerous other precedents discussed by appellants, they invariably deal with a significantly different set of facts. In each case, to arrive at the claimed subject matter, it was necessary to select portions of that subject matter from various sections of the reference disclosure and combine them [2] , *e.g.,* selecting values for variable substituents to interpolate into a generic structural formula to arrive at a specific compound. Even in those cases, if the classes were sufficiently limited or well delineated, anticipation was found. Compare *In re Arkley,* 455 F.2d 586, 172 USPQ 524 (CCPA 1972), with *In re Sivaramakrishnan,* 673 F.2d 1383, 213 USPQ 441 (CCPA 1982); *In re Schaumann,* 572 F.2d 312, 197 USPQ 5 (CCPA 1978); *In re Petering,* 301 F.2d 676, 133 USPQ 275 (CCPA 1962).

[2] Somewhat reminiscent of the lexicographer who described his dictionary as "a poem about everything," but clearly not the case here.

Of course, it goes without saying (but, equally of course, we are going to say it) that the evidence of asserted unobvious results of record is not relevant to this rejection. *In re Malagari,* 499 F.2d 1297, 182 USPQ 549 (CCPA 1974).

[2] Claim 3, which recites "an antibacterial pharmaceutical composition" broadly, may or may not be intended to be on appeal, as we have discussed above, and no separate arguments have been drawn to this claim. Nonetheless, we shall indicate our reasons for considering the above comments to apply to essentially the same degree to the rejection of claim 3, for the sake of completeness of this record, in the event, for example, that further appeal should be taken from this decision.

As we have stated above, there are only forty-six (or forty-seven) compounds described specifically in the reference. The compounds are disclosed as having "antibacterial activity" and being "meant for use as active compounds in medicaments" (see Item 57 on the title page). Various types of specific pharmaceutical compositions utilizing various acceptable carriers are expressly disclosed at pages 28 to 30. The nature of this disclosure is such that we are convinced that this reference should appropriately be

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considered to "describe," in the sense of 35 U.S.C. §102, pharmaceutical compositions containing each of the forty-six (or forty-seven) specific, pharmaceutically active compounds disclosed. Again, compare *Arkley* with *Sivaramakrishnan, Schaumann* and *Petering.*

Claims 1 and 3 have been finally rejected under 35 U.S.C. §103 as being unpatentable over Culbertson in view of Irikura. We shall not affirm this rejection.

On the issue of *prima facie* obviousness, we would have found the examiner's conclusion to be supported by the disclosure of Culbertson alone. That disclosure is generic to the here claimed subject matter, and the species of Example 45 differs from appellants' claimed compound only in having an 8-fluoro substituent in place of an [* * *] substituent.

[3] With regard to this rejection under 35 U.S.C. §103, appellants' evidence of asserted unobvious

results is relevant. We have considered that evidence, specifically the declaration of Irikura, under 35 CFR 1.132, and we disagree with the examiner's conclusion. It is the examiner's position that, to rebut the evidence of obviousness, it is necessary for the claimed compound to be unexpectedly different from the reference compounds "overall," i.e., in its therapeutic effect against all bacteria. However, appellants' thesis is that their compound is unexpectedly and significantly superior against anaerobic bacteria, a property which makes it unexpectedly suited for a specific, important utility. Conceptually, this can be the basis for overcoming a *prima facie* case of obviousness. *In re Chupp,* 816 F.2d 643, 2 USPQ2d 1437 (Fed.Cir. 1986); *In re Murch,* 464 F.2d 1051, 175 USPQ 89 (CCPA 1972). The issue in each case is the weight of the actual evidence of unobviousness presented, balanced against the weight of obviousness of record.

In the declaration (page 2, first complete paragraph), it is indicated that a difference in minimum inhibitory concentration of a factor of two is considered to be "activity ... on the same level." Even when this consideration is taken into account, however, appellants' claimed compound is significantly more active [3] against the first seven species of anaerobic bacteria listed in Table 1-b. Furthermore, Figures 1a and 1b illustrate that appellants' compound, when administered in the same dosage, provides substantially higher serum levels, for at least two hours at low doses and a substantially longer period of time at higher doses. In the absence of any explanation to support a holding to the contrary, we accept the conclusion at page 11 of the declaration that the evidence indicates "superiority" and that the "superiority was unexpected." In view of the precedents cited above, we find this evidence of unexpected superiority adequate to outweigh the evidence of obviousness found in the references adduced by the examiner.

[3] When compared to the compound of Culbertson Example 45, which the examiner agrees is the closest prior art compound of record.

The decision of the examiner is *affirmed*.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR 1.136(a). See the final rule notice, 54 F.R. 29548 (July 13, 1989), 1105 O.G. 5 (August 1, 1989).

AFFIRMED.

- End of Case -

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